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10/633,819	08/04/2003	David R. Hall		7507

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EXAMINER

PARSONS, THOMAS H

ART UNIT

PAPER NUMBER

1745

DATE MAILED: 04/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/633,819	HALL ET AL.	
	Examiner	Art Unit	
	Thomas H. Parsons	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Response to Amendment

This is in response to the Amendment filed 22 February 2006.

(Previous) DETAILED ACTION

Specification

1. The objections to the disclosure because of minor informalities have been **withdrawn** in view of Applicants' Amendment.

Claim Objections

2. The objection to claim 1 because of minor informalities has been **withdrawn** in view of Applicants' Amendment.

Claim Rejections - 35 USC § 103

3. The rejections of claims 1-6, 9, 11, 14-21 under 35 U.S.C. 103(a) as being unpatentable over Holcombe (5,516,603) have been **withdrawn** in view of a new rejection.
4. The rejections of claims 7 and 13 under 35 U.S.C. 103(a) as being unpatentable over Holcombe as applied to claim 1 above, and further in view of Hikmet et al. (6,528,204) have been **withdrawn** in view of a new rejection.
5. The rejections Claim 7 under 35 U.S.C. 103(a) as being unpatentable over Holcombe as applied to claim 1 above, and further in view of Lake (5,326,652) has been **withdrawn** in view of a new rejection.
6. The rejection of Claim 8 under 35 U.S.C. 103(a) as being unpatentable over Holcombe as applied to claim 1 above, and further in view of Steyn (6,007,932) has been **withdrawn** in view of a new rejection.

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7. The rejection of Claim 10 under 35 U.S.C. 103(a) as being unpatentable over Holcombe as applied to claim 1 above, and further in view of Das et al. (6,705,406) has been **withdrawn** in view of a new rejection.

8. The rejection of Claim 12 under 35 U.S.C. 103(a) as being unpatentable over Holcombe as applied to claim 1 above, and further in view of Finger (5,451,881) has been **withdrawn** in view of a new rejection.

Response to Arguments

9. Applicant's arguments, see page 6, last paragraph through page 7, paragraph 2, filed 22 February 2006, with respect to claims 1-21 have been fully considered and are persuasive. The rejections of the claims have been withdrawn.

(NEW) DETAILED ACTION

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 1-6, 9, 11, 14-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holcombe (5,516,603) in view of Turnbull (5,747,964) or Hargrave et al. (5,521,794) or Daniels, Jr., et al. (3,553,018).

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Claim 1: Holcombe in Figures 1 and 2 discloses a battery, battery comprising:

a battery (22); and

a housing (24) containing the battery, the housing being expandable and contractible to balance pressure (abstract; col. 1: 53-63, col. 2: 10-42, and col. 3: 6-21).

More particularly, Holcombe discloses that the flexible battery pack may be mounted about the interior and exterior circumference of a downhole tool. The flexible battery pack mounted in the tool would obviously provide a housing being expandable and contractible to balance pressure.

The recitation “**for powering downhole drilling components in a subterranean environment**” has been considered, and construed as a statement of intended use and adds no additional structure to the battery. However, Holcombe discloses a flexible battery pack for powering electrical power to a downhole tool which obviously would be capable of provided the intended use.

Holcombe does not disclose a housing enclosing and sealing a volume containing the battery, the housing being expandable and contractible to balance pressure internal to the housing with pressure external to the housing.

Turnbull discloses circuitry incorporated into a flexible printed circuit board (PCB) and used to form the outer housing into a battery (i.e. a flexible housing enclosing and sealing a volume containing the battery (col. 6: 26-43).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the housing (i.e. flexible battery pack) of Holcombe by incorporating the printed circuit board of Turnbull because both are concerned with batteries

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attached to a flexible printed circuit board, and Turnbull further disclose a flexible printed circuit board that would have enclosed and sealed a volume containing the batteries and eliminated external auxiliary contacted thereby improving the overall construction and efficiency of the battery.

Further, since the battery of the Holcombe combination is structurally similar to what is instantly claimed (i.e. flexible housing sealing the enclosing a volume containing the batteries), it obviously would have provided a pressure-balanced battery comprising housing being expandable and contractible to balance pressure internal to the housing with pressure external to the housing.

Hargrave et al. in Figure 2 disclose a housing enclosing and sealing a volume containing the battery (col. 1: 58-62, col. 2: 3-6, 13-18, 21-58 and col. 2: 66-col. 3: 6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the battery of Holcombe by incorporating the housing of Hargrave et al. because both are concerned with batteries attached to a printed circuit board, and Hargrave et al. further disclose a flexible housing the would have enclosed and sealed a volume containing the batteries and prevented the contents from being crushed on impact, and enhanced structural integrity due to its flexibility thereby improving the overall life, structural integrity, and performance of the battery.

Further, since the battery of the Holcombe combination is structurally similar to what is instantly claimed (i.e. flexible housing sealing the enclosing a volume containing the batteries), it obviously would have provided a pressure-balanced battery comprising housing being

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expandable and contractible to balance pressure internal to the housing with pressure external to the housing.

Daniels, Jr., et al. in the Figure disclose a housing enclosing and sealing a volume containing the battery, the housing being expandable and contractible to balance pressure internal to the housing with pressure external to the housing (col. 3: 27-46).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the battery of Holcombe by incorporating the housing of Daniels, Jr., et al. because Daniels, Jr., et al. teaches a housing enclosing and sealing a volume containing the battery and being expandable and contractible to balance pressure internal to the housing with pressure external to the housing that would have prevented the battery from being crushed by water pressure thereby improving the overall structural integrity and performance of the battery.

Claims 2 and 15: The limitation “wherein the housing is in operable communication with downhole fluids” has been considered but adds no further structural limitation to the battery. However, because Holcombe discloses on col. 1: 10-17 that the tool can be placed downhole, the housing would obviously be in operable communication with downhole fluids.

Claims 3 and 16: Holcombe discloses in the abstract that the housing is integrated into the annular structure (interior) of a downhole tool.

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Claims 4 and 17: The recitation “wherein at least a portion of the housing is at least one of machined, milled, cast, and forged into a downhole tool” has been considered but adds no further structural limitation to the housing.

Claims 5 and 18: Holcombe discloses a battery comprising a plurality of cells (22) electrically connected in at least one of series, parallel, and a combination thereof, within the housing (col. 2: 37-49 and col. 3: 14-17 and 27-29).

Claims 6 and 19: Holcombe discloses further comprising at least one battery terminal (28, 18), connected to the battery (22), accessible through an opening in the housing (i.e. via output terminals (30)).

Claim 9: Holcombe in Figure 1 teaches a plurality of electrochemical generators (cells 22) linked together and housed in a flexible casing (i.e. a flexible battery pack) but is silent as to a casing having a shape selected from the group consisting of a substantially planar shape, a substantially cylindrical shape, and a substantially semi-cylindrical shape.

However, Holcombe on col. 2: 10-14 teaches that the battery pack can be flattened or formed onto different shapes depending upon the shape or diameter of the tool.

Therefore, it would have been within the skill of one having ordinary skill in the art at the time the invention was made to have modified the casing to provide the claimed shape.

Claim 11: The recitation “wherein the battery is in operable communication with at least one of the group consisting of a downhole network, other downhole tools, and transmission elements configured to transmit information between downhole tools” has been considered but adds no further structural limitation to the battery. However, because Holcombe discloses on col.

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1: 10-17 that the tool can be placed downhole, the battery would obviously be capable of operable communication as claimed.

Claim 14: Holcombe in Figures 1 and 2 discloses a battery, battery comprising:

a battery (22); and

a housing (24) enclosing and sealing a volume containing the battery, the housing comprising:

a substantially rigid portion;

a resilient portion deformable to vary the volume of the housing, the resilient portion balancing pressure internal to the housing with pressure external to the housing (abstract; col. 1: 53-63, col. 2: 10-42, and col. 3: 6-21).

More particularly, Holcombe discloses that the flexible battery pack may be mounted about the interior and exterior circumference of a downhole tool. The flexible battery pack mounted in the tool would obviously provide a housing comprising both a rigid and a resilient portion with the resilient portion balancing pressure internal to the housing with pressure external to the housing.

Further, since the battery of Holcombe is structurally similar to what is instantly claimed, it obviously would have provided a pressure-balanced battery.

The recitation “**for powering downhole drilling components in a subterranean environment**” has been considered, and construed as a statement of intended use and adds no additional structure to the battery. However, since the battery of Holcombe is structurally similar to what is instantly claimed, it obviously would be capable of provided the intended use.

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Claims 20 and 21: Holcombe discloses a method for providing power to downhole drilling components in a subterranean environment, the method comprising:

providing a battery (22);

providing a sealed housing for the battery, the sealed housing having a resilient portion flexible (flexible battery pack) to vary the volume within the housing (claims 15 and 16).

Because the housing of Holcombe is structurally similar to what is instantly disclosed, and the housing of Holcombe is situated in a downhole tool and subjected to a subterranean environment, it would have been obvious to one of ordinary skill in the art at the time the invention was made that flexing the resilient portion to balance pressure internal to the housing with pressure external to the housing would occur while providing power to downhole drilling components in a subterranean environment and, similarly, that flexing would be actuated by communication between downhole fluids and the resilient portion of the housing while providing power to downhole drilling components in a subterranean environment.

12. Claims 7 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holcombe in view of Turnbull (5,747,964) or Hargrave et al. (5,521,794) or Daniels, Jr., et al. (3,553,018) as applied to claim 1 above, and further in view of Hikmet et al. (6,528,204).

Holcombe, Turnbull, Hargrave and Daniels, Jr., et al. are as applied, argued, and disclosed above, and incorporated herein.

Claim 7: The Holcombe combinations do not disclose a battery comprising an electrolyte selected from the group consisting of a fluid electrolyte and a solid electrolyte.

Hikmet et al. in Figures 3 and 4 disclose a battery comprising a fluid electrolyte.

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the battery of the Holcombe combinations by substituting the battery with the battery of Hikmet et al. because Hikmet et al. teach that it is known to incorporate a fluid electrolyte into a battery (col. 4: 16-18) that would have contributed to improving current efficiency thereby improving overall battery performance and cost.

Claim 13: The Holcombe combinations do not disclose a rechargeable battery (i.e. a secondary battery) (abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the battery of the Holcombe combinations by substituting the battery with the battery of Hikmet et al. because Hikmet et al. teach a secondary battery (col. 4: 16-18) that would have provided an improved current efficiency thereby improving overall battery performance and cost.

13. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Holcombe in view of Turnbill (5,747,964) or Hargrave et al. (5,521,794) or Daniels, Jr., et al. (3,553,018) as applied to claim 1 above, and further in view of Lake (5,326,652).

Holcombe, Turnbill, Hargrave et al. and Daniels, Jr., et al. are as applied, argued, and disclosed above, and incorporated herein.

Claim 7: The Holcombe combinations do not disclose battery comprising an electrolyte selected from the group consisting of a fluid electrolyte and a solid electrolyte.

Lake in Figures 1 and 3 disclose a battery comprising a solid electrolyte (col. 1: 25-27 and col. 3: 32-34).

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the battery of the Holcombe combinations by substituting the battery with the battery of Lake because Lake teaches that it is known to incorporate a solid electrolyte into a battery (col. 1: 25-27) that would have provided the battery with a long shelf life and operating efficiency over a wide temperature range thereby improving overall cost and battery performance.

14. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Holcombe in view of Turnbull (5,747,964) or Hargrave et al. (5,521,794) or Daniels, Jr., et al. (3,553,018) as applied to claim 1 above, and further in view of Steyn (6,007,932).

Holcombe, Turnbull, Hargrave et al. and Daniels, Jr., et al. are as applied, argued, and disclosed above, and incorporated herein.

Claim 8: The Holcombe combinations do not disclose a fuel cell.

Steyn in Figure 1 discloses a fuel cell.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the battery of the Holcombe combinations with the fuel cell of Steyn because Steyn teaches a fuel cell that would have allowed electrical interconnections between separately aligned fuel cells in order to produce a high voltage output, and would have eliminated the need to separate external reactant source thereby improving overall cost and performance.

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15. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Holcombe in view of Turnbill (5,747,964) or Hargrave et al. (5,521,794) or Daniels, Jr., et al. (3,553,018) as applied to claim 1 above, and further in view of Das et al. (6,705,406).

Holcombe, Turnbill, Hargrave et al. and Daniels, Jr., et al. are as applied, argued, and disclosed above, and incorporated herein.

Claim 10: The Holcombe combinations do not disclose a battery installed into at least one recess formed in the wall of a downhole tool.

Das et al. in Figures 2 and 3 disclose a battery (120) disposed within a recess (cavity 121) formed within the wall of a downhole tool (125) (col. 3: 49-col. 4: 32).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the tool of Holcombe combination by incorporating the recess of Das et al. because Das et al. teach a battery disposed within a recess formed within the wall of a downhole tool that would have provided a means for replacing the battery pack that does not require major disassembly thereby improving maintenance costs and lowering downtime.

16. Claim 12 rejected under 35 U.S.C. 103(a) as being unpatentable over Holcombe in view of Turnbill (5,747,964) or Hargrave et al. (5,521,794) or Daniels, Jr., et al. (3,553,018) as applied to claim 1 above, and further in view of Finger (5,451,881).

Holcombe, Turnbill, Hargrave et al. and Daniels, Jr., et al. are as applied, argued, and disclosed above, and incorporated herein.

Claim 12: The Holcombe combinations do not disclose a signal-conditioning module to modify characteristics of power output from the battery.

Finger discloses a signal-conditioning module to modify characteristics of power output from the battery (col. 13: 60-col. 14: 10).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the battery of the Holcombe combinations by incorporating the signal-conditioner of Finger because Finger discloses a signal-conditioner that would have precisely rescaled the actual battery voltage to an optimum voltage range for an A/D converter thereby improving the overall operation and performance of the battery.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas H. Parsons whose telephone number is (571) 272-1290. The examiner can normally be reached on M-F (7:00-4:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Thomas H Parsons

Examiner

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